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OCT 04 2017

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

10CFR 50.73

**SUSQUEHANNA STEAM ELECTRIC STATION**  
**LICENSEE EVENT REPORT 50-387(388)/2017-005-01**  
**UNIT 1 LICENSE NO. NPF-14**  
**UNIT 2 LICENSE NO. NPF-22**  
**PLA-7637**

**Docket No. 50-387**  
**50-388**

Attached is Licensee Event Report (LER) 50-387(388)/2017-005-01. The LER reports an event involving an automatic scram due to a loss of Main Turbine Electro-Hydraulic Control (EHC) logic power causing a high neutron flux, Reactor Protection System (RPS) trip. The condition is being reported in accordance with 10CFR 50.73(a)(2)(iv)(A) as an event that resulted in an automatic actuation of the RPS, including a reactor scram. Although no safety system functional failure occurred, this event is also reportable pursuant to 10CFR 50.73(a)(2)(v)(C) as a condition that could have prevented fulfillment of a safety function.

There were no actual consequences to the health and safety of the public as a result of this event.

This letter contains no new regulatory commitments.

A handwritten signature in black ink, appearing to be "B. Berryman", with a long horizontal stroke extending to the right.

B. Berryman

Attachment: LER 50-387(388)/2017-005-01

Copy: NRC Region I  
Ms. T. E. Hood, NRC Project Manager  
Ms. L. H. Micewski, NRC Sr. Resident Inspector  
Mr. M. Shields, PA DEP/BRP





## LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**1. FACILITY NAME**  
Susquehanna Steam Electric Station Unit 1**2. DOCKET NUMBER**  
05000387**3. PAGE**  
1 OF 4**4. TITLE** Automatic Reactor Protection System Trip on High Neutron Flux

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	08	2017	2017	- 005	- 01	10	04	2017	Susquehanna Steam Electric Station Unit 2	05000388
									FACILITY NAME	DOCKET NUMBER
										05000

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>			
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<b>10. POWER LEVEL</b>  100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

LICENSEE CONTACT

R. W. McIntosh, Senior Engineer - Nuclear Regulatory Affairs

TELEPHONE NUMBER (Include Area Code)

(570) 542-1695

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

**14. SUPPLEMENTAL REPORT EXPECTED**☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR
-	-	-

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On June 8, 2017 at 1527 hours, the reactor automatically scrammed due to a loss of Main Turbine-Electro-Hydraulic Control (EHC) logic power causing a high neutron flux, Reactor Protection System (RPS) trip. The safety systems operated as expected. Secondary Containment differential pressure lowered to 0" WG due to a trip of the normal operation of the Reactor Building Ventilation system. The differential pressure was restored by the initiation of Standby Gas Treatment System.

The scram was caused directly by a DC+ (direct current, positive) test lead (Maxi Grabber) that inadvertently contacted with the grounding screw, causing a short and momentary loss of EHC logic power. Immediate action was taken to validate that there was no damage to the +30 VDC (volts DC) EHC logic. The root cause for this event is an insufficient focus on the High Risk Activity of adjusting the EHC power supply, and inadequate risk mitigating actions for that activity.

The condition is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in an automatic actuation of the RPS, including reactor scram. Although no safety system functional failure occurred, this event is also reportable pursuant to 10CFR 50.73(a)(2)(v)(C) as a condition that could have prevented fulfillment of a safety function. There were no actual, or potential consequences to the health and safety of the public as a result of this event.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Susquehanna Steam Electric Station Unit 1	05000387	YEAR	SEQUENTIAL NUMBER	REV NO.
		2017	- 005	- 01

**NARRATIVE****CONDITIONS PRIOR TO EVENT**

Unit 1 – Mode 1, approximately 100 percent Rated Thermal Power  
Unit 2 – Mode 1, approximately 100 percent Rated Thermal Power

There were no structures, systems, or components that were inoperable at the start of the event that contributed to the event.

**EVENT DESCRIPTION**

On June 8, 2017, at 1527 hours, the reactor automatically scrammed due to a loss of Main Turbine Electro-Hydraulic Control (EHC) [EIS System Code TG] logic power causing a high neutron flux, Reactor Protection System (RPS) trip. Workers were restoring from making a power supply swap for the EHC, from permanent Magnetic Generator (PMG) to a house power supply. A Maxi Grabber was being removed from the PMG positive lug and came in contact with a grounding screw, resulting in a short and causing a loss of EHC pressure control.

After the momentary short cleared, the meter indications showed the power supply returned to the normal operating voltage. The 30 VDC (volts DC) bus voltage transient resulted in temporary saturation of the pressure regulatory output and caused the bypass valve fast open logic to actuate and closure of the control valves. Once the control valves closed beyond the bypass valve capacity, the reactor pressure increased resulting in the high neutron flux reactor scram.

All control rods inserted and both reactor recirculation pumps tripped due to reaching reactor water low level 2. Reactor water level lowered to -49 inches causing Level 3 (+13 inches) and Level 2 (-38 inches) isolations. High Pressure Coolant Injection (HPCI) [EIS System Code BJ] and Reactor Core Isolation Cooling (RCIC) [EIS System Code BN] automatically initiated and were overridden by control room operations after reactor pressure vessel water level was restored to the normal band with feedwater. HPCI and RCIC injected to the Reactor Coolant System during reactor level stabilization. Division 1 RHR was manually placed in suppression pool cooling. All isolations and initiations occurred as expected. No main steam relief valves opened. Pressure was controlled via main turbine bypass valve operation. The safety systems operated as expected.

Secondary Containment [EIS System Identifier: NG] Zone 1, 2, and 3 differential pressure lowered to 0" WG due to a trip of the normal operation of the Reactor Building Ventilation system that resulted from the Unit 1 Level 2 isolation. The differential pressure was restored to Zones 1, 2, and 3 by the initiation of Standby Gas Treatment System on the Unit 1 Level 2 initiation.



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Susquehanna Steam Electric Station Unit 1	05000387	YEAR	SEQUENTIAL NUMBER	REV NO.
		2017	- 005	- 01

This event was reported by notification EN 52795, on June 8, 2017 at 1910 hours, under the four and eight-hour non-emergency reporting requirements pursuant to 10CFR 50.72(b)(2) and (b)(3). This event is also reportable in accordance with 10CFR 50.73(a)(2)(iv)(A) as an event that resulted in an automatic actuation of the RPS, including reactor scram, HPCI and RCIC. Although no system safety functional failure occurred, this event is also reportable pursuant to 10CFR 50.73(a)(2)(v)(C) as a condition that could have prevented fulfillment of a safety function.

## CAUSE OF EVENT

The scram was caused directly by a DC+ (direct current, positive) test lead (Maxi Grabber) that inadvertently contacted with the PMG Power Supply grounding screw, causing a short and momentary loss of EHC logic power, which then caused an EHC transient. This resulted in the high flux RPS trip. The root cause for this event is an insufficient focus on the High Risk Activity of adjusting the EHC power supply, and inadequate risk mitigating actions for that activity.

## ANALYSIS/SAFETY SIGNIFICANCE

There were no actual, or potential for safety consequences from this event. The neutron monitoring system trip protects the fuel against high heat generation rates. The sequence of events and systems operation during this event remained consistent with existing safety analysis and design basis for these systems, the scram occurred before any thermal limits were reached, and in a manner bounded by the limiting events described in the Final Safety Analysis Report (FSAR). Required isolations and initiations occurred as would be expected for this event. No main steam relief valves opened and pressure was controlled via main turbine bypass valve operation. The safety systems operated as expected.

An engineering evaluation was performed and concluded that secondary containment could have performed its safety function of isolating as assumed in the accident analysis and also of re-establishing 0.25 inches vacuum (drawdown) within the assumed accident analysis time (10 minutes). Therefore, the subject event did not cause a loss of safety function. This event will not be counted as a safety system functional failure (SSFF) for the NRC performance indicator based on the engineering analysis that shows there was no loss of ability to fulfill the safety function.

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		2017	- 005	- 01

**CORRECTIVE ACTIONS**

Immediate action was taken to validate that there was no damage to the +30 VDC EHC logic.  
The key corrective actions include the following:

1. The Integrated Risk Management Procedure will be revised to include a Senior Reactor Operator (SRO) in the quorum for a Risk Management Challenge Board (RMCB) concerning an Operational High Risk activity.
2. The Integrated Risk Management Procedure will be revised to include individuals directly involved with the high risk portion of an activity as required in the quorum for a RMCB.

**PREVIOUS SIMILAR EVENTS**

No other similar events were identified with the same underlying concern or reason for occurrence.